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ABSTRACT

Orientation to time, place, and person is a central aspect of cognitive functioning. Measures of orientation, as employed in the psychiatric mental status examination, evaluate the accuracy of orientation in present awareness, and are applicable only to severely disturbed psychiatric populations in whom obvious deficits would be expected. The method for orientation measurement developed here focuses on the orientation process in memory as shown in the narration of past personal experience, rather than on present status, and may be applied to normal as well as pathological subject populations. The pattern and latency of orientation to time, place, and person were measured in a brief narrative speech sample for 53 normal and 22 psychiatric subjects. Orientation scoring was based on a reference to oneself in relation to each of the three orientation dimensions (time, place, person). The orientation latency score reflected the proportion of narrative length at which orientation on all three dimensions first occurred in a given narrative. Pattern of orientation was defined as the rank order in which the first coded reference to time, place, and person occurred in the narrative. Referential activity and affective flattening were also scored. The results indicated that orientation pattern was highly systematic for the normals but not for the clinical sample. For all subjects, orientation latency was significantly related to measures of sensory imaginal and affective expression, suggesting a relationship between the cognitive and affective spheres. Fine discriminations in orientation pattern and latency in the inpatient group may have important diagnostic and prognostic implications that are not measured in traditional mental status assessment procedures. (Author/NRB)

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# The Relationship of Cognition and Affect in the Orientation Process*

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Running head: THE ORIENTATION PROCESS

## Notes

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Abstract

Measures of orientation to time, place, and person, as employed in the psychiatric mental status examination, evaluate the accuracy of orientation in present awareness, and are applicable only to severely disturbed psychiatric populations in whom obvious deficits would be expected. The method for orientation measurement developed here focuses on the orientation process in memory as shown in the narration of past personal experience, rather than on present status, and may be applied to normal as well as pathological subject populations. In this study, the pattern and latency of orientation to time, place, and person were measured in a brief narrative speech sample for 53 normal and 22 psychiatric subjects. Orientation pattern was highly systematic for the normals but not for the clinical sample. Fine discriminations in orientation pattern and latency in the inpatient group may have important diagnostic and prognostic implications that are not measured in traditional mental status assessment procedures. For all subjects, orientation latency was significantly related to measures of sensory imaginal and affective expression, suggesting relationship between the cognitive and affective spheres.

Orientation to time, place, and person, is a central aspect of cognitive functioning. Veridical orientation is assumed in normal individuals, and a deficit in these areas is interpreted as an indication of psychosis, severe organic disorder, or other altered state. Orientation was first noted for its significance as a diagnostic indicator by Kraepelin in 1902, and was later introduced in America as a part of the psychiatric mental status examination under the heading of "Sensorium" in Adolph Meyer's "Outlines of Examinations" in 1918. Typically, patients are asked the date or approximate hour of day, where and who they are, and who they are with (Freedman, Kaplan, and Sadock, 1975). The assessment of orientation has remained essentially unchanged in its brevity, simplicity, and power, since Kraepelin's time.

In spite of its accepted role as a diagnostic criterion, surprisingly little is known of the specific functional role and theoretical significance of the orientation process in cognition. That is, little is known of the mechanisms or structures by which the orientation process might be assumed to operate, or of the relationship that these structures might share with other important processes of thought. In this paper we will attempt to develop a more comprehensive understanding of the role of orientation phenomena in mental functioning. Specifically, we will examine orientation functioning in normal and pathological states as it relates to expression of sensory imagery and emotion in speech, and expression of emotion in behavior.

While no data exist as yet on orientation functioning in

normal cognition, two lines of scientific inquiry have begun to shed some light on the functional significance of personal orientation phenomena in psychopathology or other altered states. The first of these may be found in studies of recovery from electroconvulsive therapy (ECT). In these studies, personal orientation has been examined from the perspective of reorientation. That is, speed in reorienting the self to the environment is examined following the loss of consciousness after electric shock. Standard mental status assessment procedures were used as outlined above. Beginning with the work of Lunn and Trolle (1949) it was found that recovery of orientation after ECT followed a distinct and ordered path: orientation to person recovered first, orientation to place second, and orientation to time last. This result has been replicated in at least five subsequent studies: Wilcox, 1956; Lancaster et al., 1958; Gottlieb and Wilson, 1965; Valentine et al., 1968; and d'Elia, 1970. This research demonstrates that systematic functional sequence or "structure" in orientation may be seen in reorientation following ECT. The existence of such sequential structure suggests that a cognitive mechanism for orientation is in operation.

A second line of research approaches the study of personal orientation from the perspective of disorientation as seen in the initial stages of acute mental illness. Three symptoms of disorientation have been identified by Freeman and Melges (1978): "temporal disorganization", "depersonalization", and "persecutory

ideation". In the course of their work, the authors describe these symptoms as follows: Temporal disorganization refers to a disordered sense of time, marked by altered perceptions of rate, sequence, and goal directedness of thought. It manifests itself in confusion as to the speed or duration of events and their order of occurrence. Depersonalization is a special case of disordered spatial perception conceptualized as a breakdown in a sense of personal space. It is reflected in feelings of self-estrangement and in perceived diffusion of body image. Persecutory ideation is the belief in a global conspiracy directed against the self. It is an example of a disordered sense of person, or more specifically, a disordered sense of self relative to others.

Melges et. al. (1970, 1974) found and replicated the result that marijuana smoking or tetrahydrocannabinol (THC) ingestion in heavy dosages produced symptoms of temporal disorganization, depersonalization, and persecutory ideation in the self report of normal subjects. In related studies using acutely psychotic inpatient populations, temporal disorganization was demonstrated to covary significantly with self reported symptoms of depersonalization at the time of admission (Freeman and Melges, 1977), at discharge (Melges and Freeman, 1977), and with symptoms of persecutory ideation (Freeman and Melges, 1978). In their studies Freeman and Melges observe the following sequential pattern of progressive disorientation: "temporal disorganization followed by depersonalization and then persecutory ideation (1978, p.124)." In our terms,

disorientation to time occurs first, to a sense of space second, and to person last. It is striking to note that the sequential pattern observed in disorientation (time, place, and person) is precisely the reverse of the pattern of reorientation documented in the ECT literature (person, place, and time). The implication is that recovery and loss of orientation, being inverse processes, could operate reciprocally via a cognitive orientation mechanism.

The previous orientation research, as presented above, has investigated only gross aberrations in orientation to the actual present context. Subjects in reorientation and disorientation studies were amnesic, intoxicated with THC, or acutely psychotic. Orientation measurement procedures were those of traditional psychiatric mental status assessment, i.e., testing the individual's subjective orientation to time, place, and person in relation to his actual state. In the present study, we investigate variability in the orientation process across the continuum of psychological functioning, in normal and psychotic subject samples. Our method involves a procedure of language analysis applied to narrative speech that measures (a) the latency and (b) the order or sequential pattern of orientation cues to time, place, and person, as they are introduced in describing a past event. The present method focuses on the structure and function of the orientation process in memory, rather than on present orientation. Our method is designed to detect variations in the orienting function more subtle than

those measurable by the standard method of assessment, and to be sensitive to variation even within the normal range.

In this study, we predict that normal subjects will orient to time, place, and person more readily and more systematically in the narrative description of experience than will psychotic subjects. We also predict that a systematic sequential orientation pattern will emerge, and that it will correspond to the reciprocal patterning demonstrated in the orientation studies reviewed above. Finally, we anticipate that our orientation measures will show relationship to other important aspects of mental functioning; in particular to the retrieval of sensory imagery and affective experience from memory as expressed in language, and to the expression of emotion in behavior. To support this last prediction, we must return to the "warming up" hypothesis of Karl Lashley (1960).

According to Lashley, nearly all memories are associated with a particular time and place, and are stored and retrieved in terms of these coordinates. Lashley explains: "recall involves the subthreshold activation of a whole system of associations which exert some sort of mutual facilitation" (1960, p. 497). He goes on to say that the "effective stimulus" necessary for association is "not only the object" but also its spatial and temporal setting:

> Every stimulus has a space setting...the memory trace of the [stimulus] figure is tied in with the space coordinates of the animal's postural system. This system of space coordinates is part of the postural reflex system which pervades every aspect of behavior... [also]...Most skilled acts, from running a maze to playing a musical phrase, or speaking a sentence,

> involve a timed series of actions which cannot be accounted for by a simple chain of conditioned reflexes. The serial timing of actions is among the most important and least studied of behavioural problems...the memory trace is associated with this series as well as with the particular objects which make up its core (Lashley, 1960 p.496-497).

In Lashley's terms, association to the spatial and temporal coordinates of an event will prime or "warm up" the process by which experience is retrieved from memory. Thus early and systematic orientation to time, place, and person in narrative speech is expected to facilitate association to the sensory and emotional correlates of experience. Conversely, delay and inconsistency in orientation will interfere with the associative process.

To test these predictions, orientation measures will be compared to levels of sensory and emotional imagery in the speech of normal and psychotic subjects, and to the capacity for emotional expression observed in the behavior of psychotic subjects. Sensory and emotional imagery expressed in speech will be assessed using a measure of Referential Activity (RA) developed by Bucci (Bucci and Freedman, 1978; Bucci, 1984). Language that is high in RA has a concrete perceptual or sensory quality, is well detailed, expressive, and clear; the type of language that indicates the presence of imagery, feeling, and emotion in the speaker's mind and tends to evoke corresponding experience in the listener. Language rated as low in RA is abstract and general; the type of language whose meaning tends to rest more heavily on verbal rather than imaginal associations. Rating scales capturing these dimensions of language style have

been developed and will be applied to brief spoken narratives. We expect that early and systematic orientation in narrative speech will be associated with high RA language style for both subject samples.

The capacity for affective behavioral expression in psychotic subjects will be assessed from videotapes using a measure of Affective Flattening developed by Andreasan (1979). This measure was designed for application to clinical subjects, and will be applied here only to the psychotic sample. According to Andreasan's scale, the capacity for affective expression is described as "Flat" if restricted, withdrawn, or depressed, and "Full" (or "Not Flat") if interpersonally related, appropriate, and responsive across the affective range. Zubin has demonstrated that this distinction of affective expression is of particular significance as a prognostic indicator in psychosis, with relative fullness of affective expression in behavior indicating greater potential for improvement (Zubin et al., 1961). Here we expect that early and systematic orientation in speech will be related to fullness of affective expression as measured in behavior of the psychotic subjects.

## METHODS

### Subjects

Subjects in the non-clinical sample were 53 nursing students at a New York City teaching hospital who volunteered and were

compensated for their participation. All had completed at least two years of college and were fluent English speakers.

Subjects in the psychiatric sample were 22 inpatients admitted over a four month period to the same New York City teaching hospital. These subjects had recently exhibited acute psychotic symptoms including delusions and hallucinations and received DSM-III diagnoses of schizophrenia, schizophreniform psychosis, schizoaffective disorder, bipolar affective disorder, and major depression with psychosis. Patients manifesting obvious cognitive deficits, organicity, substance abuse, dull-normal verbal IQ's or lower, or more than one hospital admission in the previous year, or more than three in the past five years, were excluded from the study. Subjects were medicated with antipsychotic and antiParkinson agents. Mean level of education was 12 years, and all subjects were fluent English speakers. All measures were administered within the first week of hospital admission. Mental status was examined and no gross disturbances in orientation were noted at the time of testing.

All data used in this study had been collected previously in two separate studies of communication processes in normal and psychotic samples. Other findings for these subject groups have been reported elsewhere (Bucci, 1984; Fosha, 1983).

Procedure

The following instructions were given for collection of samples of speech in the clinical and non-clinical subject groups:

> Now I'd like you to speak for five minutes about any interesting, dramatic, or important life experience you've had, anything at all that you'd like to tell about. I'll be here listening to you, but I won't interrupt you. I prefer not to speak, even to answer questions, until the five minutes are up.
>
> Do you have any questions? You may begin whenever you're ready.

The instructions might be varied slightly in order to maintain a conversational tone, provided all necessary points were covered. Limited additional support was given for psychiatric subjects when this was necessary to maintain attention and elicit an adequate speech sample, e.g., "you're doing just fine, keep on going". However, supports were never directed toward eliciting specific speech content. All sessions were videotaped. Speech samples were transcribed from tape recordings and typed following standard transcription procedures (Dahl, 1972). Orientation scoring was carried out according to a procedure developed by Dodd. Referential Activity was scored in the transcribed monolcgues according to a procedure developed by Bucci (1984). Affective Flattening was scored in behavior of the psychotic subjects from videotapes, according to procedures developed by Andreasan (1979), as reported in Fosha (1983). The scoring criteria for these measures will be described briefly here.

Scoring of Orientation Latency and Pattern

Orientation scoring is based on a reference to oneself in relation to each of the three orientation dimensions. Orientation to time requires reference to oneself at a particular time, (e.g., "I arrived at noon"); orientation to place requires

reference to oneself at a particular place (e.g., "I was waiting at the train station"); and orientation to person requires reference to oneself with a particular person (e.g., "my sister came to pick me up"). The reference must include both the overt mention of the self, and relationship to a particular time, place, or person. A manual for coding orientation, with examples meeting and failing to meet scoring criteria, was developed for the coders in this study as reported in Dodd (1985).

Orientation latency. Latency was first measured separately for the dimensions of time, place, and person. Each latency score reflects the proportion of the total narrative length at which orientation to time, place, or person first occurred in a given narrative. An overall orientation latency score was calculated by averaging the three individual latency scores. This overall score reflects the proportion of narrative length at which orientation on all three dimensions first occurred in a given narrative. Orientation latency scores thus range between slightly above 0 (for narratives in which orientation is immediate) to 1 (for narratives in which orientation cues are absent).

Orientation Pattern. Pattern of orientation was defined as the rank order in which the first coded reference to time, place, and person occurred in a given narrative. Pattern was scored where two or more dimensions of orientation were coded.

Interrater reliability of two coders for orientation

latency scoring was r=.97 for protocols of normal subjects and r=.92 for psychotic subjects (reliability reported as coefficient alpha, Cronbach et.al. 1972). Exact interrater agreement of two coders for pattern of orientation was 100% for normal narratives, and 73% for narratives of psychotic subjects. (Narratives of the psychotic subjects are generally less clear, and orientation references contained in them less well defined, leading to the somewhat lower reliability levels for this group).

Referential Activity

Referential Activity (RA) was scored using four ten point rating scales developed for assessment of this dimension in natural language (Bucci, 1984): 1) "Sensory Concreteness" reflects the degree of sensory or perceptual quality in speech; i.e., the extent to which language refers to experienced, palpable properties of things or feelings rather than to abstract concepts; 2) "Specificity" refers to amount of expressive or perceptual detail; 3) "Clarity" refers to clarity of an image as seen through language, i.e., the extent to which the verbal expression of imagery and feeling are focused and definite rather than diffuse and blurred; and 4) "Evocativeness" refers to the imaginal and affective impact of the narrative on the listener or reader; i.e., the extent to which the narrative calls up imagery or feeling in the rater's mind. The choice of these scales is based on both experimental research and consensus of literary critics as to properties of language associated with expression of imagery and feeling. (Paivio, 1971; Strunk &

White, 1972). The four scales are averaged to yield an overall Referential Activity language style score. Interrater reliability was r=.88 for the speech samples of the normal subjects, and r=.74 for the psychotic subjects (two coders, coefficient alpha).

Affective Flattening

Affective Flattening was rated from videotapes of the psychotic subjects during the narrative and interview sessions, using the following assessment categories developed by Andreasan (1979): 1) change in facial expression, 2) spontaneous movement, 3) expressive gestures, 4) appropriateness of affect, 5) vocal inflection, 6) speech pace, and 7) a global rating of fullness or flatness of affective behavioral expression. Assessment categories were rated on a 4 point scale. Patients with average scores of 2 or below are classified as demonstrating Full Affect, and those scoring above 2 as demonstrating Flat Affect. Interrater reliability for Affective Flattening subscales averaged above r=.80 (two coders, coefficient alpha).

## RESULTS

### Comparison of Normal and Psychotic Subjects

Orientation latency. Mean latency values for orientation to time, place and person are presented in Table 1. Normal

INSERT TABLE 1 ABOUT HERE

subjects showed significantly earlier overall orientation latency; they oriented to all three dimensions, on average, by about .15 of the total narrative length, compared to .28 of the narrative for psychotic subjects ($t = 2.92$, $p < .01$). This difference was carried entirely by orientation on the dimensions of time and place. Normal subjects established the time and place setting of their narratives exceedingly early, at mean proportions of .05 and .07 of narrative length respectively. The following excerpt is the introductory segment of a narrative spoken by a normal subject in this study. It illustrates the very early orientation to time and place that was common in the normal sample:

> The experience I'm going to talk about is one I had last summer. I was working - for the Indian Health Service in Montana...

The speaker refers to himself in a specific time and place immediately in the narrative ("last summer...in Montana").

All psychotic subjects were able to produce narratives in response to the instructions; however, early orientation was rare. On average, psychotic subjects oriented to time and place significantly later than the normal group, at proportions of .28 and .26 of narrative length respectively, or not until more than one fourth of the total narrative had elapsed. The following excerpt is the introduction of a narrative spoken by a psychotic subject in this study, in which orientation to time and place is absent:

> I realize that you - you - you have to love yourself before you love somebody else. Mainly and uh - and uh - face responsibilities on your own. Which I've never

> been able to - really - you know - do - and you know it's a lot of things - and uh - and you know I guess you can be trying to be real nice to people and they take it the wrong way. And its just a lot of things, its so many things, I can't really go into it...

As regards latency of orientation to another person, the two subject groups were essentially equivalent. Normal subjects oriented to another person at a mean proportion of .33, and psychotic subjects at a mean proportion of .31 of total narrative length. Thus, normal and psychotic groups differed in the latency of constructing a time-place context into which persons would be introduced into their narratives, i.e., in the introduction of the "scene-setting" dimensions, rather than in the latency of introducing the characters who would figure in their stories.

Orientation Pattern. The tendency of normal subjects to set the time-place context before introducing a person into a narrative, which is suggested by the above data, is demonstrated directly in the orientation pattern results. The six possible permutations of order for orienting to time, place, and person are listed in Table 2. Combining permutations in the table, a

INSERT TABLE 2 ABOUT HERE

striking level of consistency becomes apparent in the orientation of normal subjects. Fifty-two of 53, or 98% of normal subjects oriented to at least one of the dimensions of time or place before orienting to person (collapsing permutations 1 through 4). This figure well exceeds that of 57.7% found for the psychotic subjects (chi square=18.24, 1 df, $p < .001$), and also that of

66.7% expected by chance. The normal orientation pattern may be specified even more precisely. Eighty-one percent of normal subjects oriented to both dimensions of time and place before person (collapsing permutations 1 and 2), compared to 52% of psychotics with 33.3% expected by chance. Finally, 57% or more than half of the normal subjects oriented in exactly the order time-place-person (permutation 1). This figure compares to only 29% of the psychotic subjects, with 16.7% expected by chance. The data suggest a highly systematic pattern of orientation for normal subjects in generating a narrative description of a past event. This systematic structure, and the cognitive mechanism underlying it, appears to be impaired in the psychotic sample. This is illustrated in the following excerpt, the introduction of a narrative reported by a subject in the psychotic sample:

> I don't know why my eyesight is failing. It's not just glasses. It's something that I was injected with. And the doctor didn't - he or she didn't - mean to hurt me. Its just that they really didn't know how to deal with the problem. And I would like my face back, if you don't mind. I don't want a swollen face where everytime I walk in a room, "Oh, look at that, that's a really crapped up one." My face was ordinary, if you saw my baby pictures. You didn't see my baby pictures, of course not. But if you had seen them, you would see my face is not this different. I'm looking - I'm afraid that maybe I'm being injected with male hormones. And that's - and I'm looking more and more masculine than what I used to look...

Note that the first mention of a person ("the doctor") is introduced out of the context of a time or place. Only later is the time and place set ("today" and "the hospital"; lines 18 and 20, not shown here). The intervening monologue conveys an experience of persecution in personal relationship (a fear that

the doctor has injected the patient with male hormones). Since this experience is presumably a delusion, there exists no reality context of time and place in memory. The present time and place, though somewhat belatedly, is substituted as a frame for the narrative.

Orientation Latency vs. Referential Activity

Orientation latency was significantly correlated with Referential Activity in both subject groups. Correlation coefficients for overall orientation latency with Referential Activity were .54 and .48 for normal and psychotic subjects respectively. Correlation coefficients for individual orientation dimensions of time, place, and person are shown in Table 3. Of the three orientation dimensions, it can be seen

INSERT TABLE 3 ABOUT HERE

that orientation to person correlated most strongly with Referential Activity, thus accounting for the majority of the observed effect.

Thus, for all subjects, earlier orientation to a time, and a place, and especially to another person in a given narrative was associated with a significantly higher level of affective and sensory imagery expressed in speech. In some cases of very early orientation, the first few lines of speech alone could be used to predict the level of Referential Activity in the remaining five minutes of the narrative. This is illustrated in the introductory segment of a narrative reported by a subject in

the normal sample:

> Okay, this is just me talking. Okay. Terrific. Hi there people and uh let's see, any interesting experiences I've ever had. I think one that definitely has to go down in history was the day I decided to bring a - uh - a duck home from the Bronx Zoo. And - uh - what happened was that my mother needed an animal at her - uh pet shop, her lab, that she helps run at a high school and so I was naturally nominated to go get this duck cause my parents weren't around at the time and I unfortunately don't have a car so I had to go there by train - got the duck, everything's fine. I stuck him in a carton - however to get back from the Bronx Zoo takes around 2 hours by bus and train and if you know, animals such as ducks are not toilet trained - and so it was quite a mess between the duck sticking its head out, people on the train getting quite upset etcetera, plus - the duck all over the place, on my pants, on the carton. It was definitely an experience I wouldn't want to relive ever...

Orientation to time, place, and person is early in the passage: the particular time is "the day", the first mention of place is "home", and the first person mentioned with reference to the speaker is the "mother". A high level of affective and sensory imaginal detail follows, and the story is rated high on the RA scales. The story is expressive and clear; the reader gets a good sense of how it might actually have felt to be in such a predicament.

In contrast, the following segment, also from the normal sample, is the introduction of a narrative in which orientation cues were put off until its very conclusion (not shown here) and in which affective and sensory details are noticably lacking throughout:

> I don't know, couple of years back I didn't really want to be a nurse. I wanted to be, you know, something else. And it just - I don't know, over the - over the last couple of years, I've changed my mind a lot, and

> I've you know, been able to you know, s-sort out what's going on, and I realize that. Also, I've had a little bit of experience with the idea of becoming a nurse, and you know, working with that. And, uh - I realize that I'd like - I liked it you know. And I tr-, applied to the school and I wasn't sure I was gonna get in cause I didn't think that my marks were so hot. And uh, so I applied and like - I spent like a whole semester - no 2 semesters, in limbo cause I didn't know what I was doing. If I- If I didn't get into nursing school I don't kn- I didn't know what I was going to do. I had no idea. But then when I got in I was like really happy. Now, I don't know, I'm not so sure - It's okay. It's uh - uh - it's hard, it was hard, it was hard in the beginning...

The phrase "couple of years back" in the first line of the excerpt above is not a valid time reference because it does not refer to a point in time, but to an uncircumscribed period of time. No mention of the speaker in an actual place or with a particular person was made until the narrative's very close. As we expect, the narrative is diffuse and vague, and tends not to hold the listener's (or reader's) attention, or to evoke imagery, and is rated low on the RA scales.

Thus, our findings seem to demonstrate the predicted "warming" or facilitating effect of orientation on affective and sensory expression. Early orientation to the temporal, spatial, and interpersonal aspects of remembered experience was associated with increased report of sensory and emotional detail from memory. As stated above, this effect was present for the psychotic as well as for the normal subjects, and was carried most strongly by orientation of the self to another person.

Orientation Latency vs. Affective Flattening

As discussed above, the Flatness of Affect scale is a

behavioral measure which is applied to and scored from videotapes, and was used to measure the capacity for emotional expression in the psychotic sample. The results support the above findings. Subjects characterized by "Not Flat" or "Full" affective expression in their behavior (i.e. a higher level of affective expression) oriented significantly earlier in their narratives than those characterized by "Flat" or blunted affective expression, as shown in Table 4. This difference was

INSERT TABLE 4 ABOUT HERE

significant for orientation latency scores overall, and for orientation to person and place, and was in the expected direction (although not significant) for orientation to time. Thus, earlier orientation in narration was associated with a greater capacity for emotional expression in behavior. The orientation measure was able to discriminate variation in the capacity for affective expression even within the psychotic range.

## DISCUSSION

This study has demonstrated variation in the orientation function in normal and psychotic subjects, both between and within these subject groups. These differences were observed in the simple act of story-telling--generating a brief spoken narrative describing a personal experience. Normal subjects differed significantly from psychotic patients in the latency of

introduction of the dimensions of time and place into their narratives, and in following a systematic sequential orientation pattern when reporting a past event. Within both subject groups, earlier orientation to time, place, and person was associated with higher levels of sensory imagery and emotion in the report of past personal experience. Within the psychotic sample, earlier orientation in speech was also associated with a greater capacity for emotional expression in behavior, and thus, by implication, with positive prognosis.

The sequential pattern of orientation to time, place, and person demonstrated by the majority of normal subjects in this study corresponds directly to the sequence found in studies of disorientation in altered states, and inversely to the pattern found in studies of reorientation following ECT. Such consistency in sequential patterning suggests the presence of a cognitive structure or mechanism for orientation that may operate reciprocally in different conditions. The basis for the predominant pattern of orientation demonstrated by normal subjects in the present study (time-place-person) remains to be explored. We may speculate that the precedence of orientation to time over that of place in the retrieval process may follow from the concept of time as a continuous stream with no reversal. The time coordinate uniquely defines an event from the past. In contrast, an individual can return to the same place many times. Thus ambiguity in retrieval is minimized if location in time precedes location in space. Furthermore, both coordinates are necessary to construct a stable reality context into which an

interaction with another person may be set; in narration as in the theatre, the scene needs to be set before the characters are introduced.

The orientation pattern demonstrated by the psychotic subjects in our study was far less systematic than that of the normal group. As discussed above, psychotic subjects did not construct a specific reality for their narratives so that their characters--and their selves--were effectively oriented to time and place. This deficit may be a subtle form of the break with reality noted in psychosis, but one which cannot be recognized by standard orientation assessment. It is a question for further investigation whether this deficit is the result of organization of memory or of retrieval processes, or of some combination of the two.

In the present study, within group differences in levels of Referential Activity in speech were carried more strongly by orientation to person than to time and place for both normal and psychotic subjects. This suggests that orientation to person is of particular significance as a factor in the release of sensory and emotional experience from memory. This is not surprising. Orientation of the self to time and place are basic cognitive parameters of sensory organization, the common coordinates for the structure of all sensory input. Orientation to another person is a necessary structural dimension only in experiences of interpersonal relationship--experiences that are in reality most often steeped in sensory and emotional detail. It follows

then, that orientation to another person in retrieval from memory would be most strongly associated with the report of feelings and emotions in recall.

Thus, orientation to another person plays a dual role in thought functioning. It is a fundamental structural element for organizing life experience and is also strongly associated with emotion, and so may be viewed as a crossroads of cognitive and affective thought functioning. Here we have demonstrated this empirically, in measurement of orientation patterns and latency and their relationship to sensory and affective expression. Current psychodynamic psychology relates cognitive and affective functioning theoretically using the construct of "Object Relations". According to this formulation, relationships to significant human "objects" in our lives (intrapsychic representations of significant others) constitutes the point at which cognition and emotion interface. Kernberg writes, "intrapsychic experience integrates affect and cognition in internalized object relations (1976, p.111)."

While the orientation function has not previously been studied directly, considerable evidence for the organization of life experience by time, place, and person can be found in the scientific literature and anecdote. For example, in discussing the theory of cognitive structure, Neisser writes:

> When we first perceive or imagine something, the process of construction is generally not limited to the object itself. We generally build (or rebuild) a spatial, temporal, and conceptual framework as well. ...when you see a friend across the street, you are not only seeing him. 'He', a person of a particular kind with a particular relevance to your life, is appearing

> 'there' at a particular place in space, and 'then' at a certain point in time. Similarly, a spoken sentence is not just a string of words to be identified, but it has a particular meaning, is spoken by a particular person, at a particular time and place. These frames of reference can be thought of as a third level of cognitive construction. ...background processes build and maintain schemata to which these objects are referred (1965/1968, p.286).

The role of orientation in memory and retrieval is reflected in many well-known mnemonic techniques. For example, in the method of loci, reportedly used by orators in ancient Rome (Yates, 1966), and still applied by experts in memory training, the items or ideas to be remembered are associated with an ordered sequence of places which would be encountered in a familiar route (e.g., a stroll through the Roman forum, or a walk across one's campus). To retrieve the sequence, the speaker follows the route in imagination and thus reevokes the associated ideas in their correct order.

Similar devices were used by the mnenomist "S", as observed by Luria. In the following excerpt S is attempting to retrieve a list of items he had been given fifteen years before. Note the use of orientation cues en route to recall:

> Yes, Yes...this was a series you gave me once when we were in your apartment...you were sitting at the table and I in the rocking chair...you were wearing a gray suit and you looked at me like this...Now then, I can see you saying...(Luria, 1968 p.12).

For anecdotal illustration of the facilitating effect of orientation structures on emotional as well as cognitive aspects of memory we may turn to the annals of crime. As all readers of mystery fiction know, returning to the "scene of the crime" may

have an incriminating effect. The suspect is led at the fateful hour to the alley in which the murder was committed, and an actor is cast in the victim's role. Under these circumstances, in which time, place and protagonist are reproduced, we expect that the suspect's emotional state at the time of the crime will be powerfully and unavoidably evoked. Nostalgia is a less extreme and more common form of this same effect. The return with a friend to a particular place held in common at one time may reawaken the feelings and moods that were then shared by both.

The effect of orientation cues in the retrieval of memory and emotional experience has also been recognized and used in psychotherapy. In a discussion of techniques for evoking expression of patient experience in psychotherapy, Zucker suggests that the patient be encouraged to:

> ...bring in his life, not just talk about it, but rather to narrate it authentically. Such an account calls for particulars concerning where, when, and what. Events need to be recreated in such a way that it is almost possible to visualize the scene and hear the actors. ... If a person says that he has had a fight with his wife, then the conversation has to be heard word for word. Such duplication places the person back in the experience and brings into play the qualities that such experience call out in him (1967, p.42)."

Thus the cueing of orientation may have direct implications for therapeutic technique. Our data suggest that questioning patients as to the specific time and place of events, and the people involved in them, may serve a useful role in facilitating the retrieval and report of associated themes and moods of experience, even when such information does not seem to be materially relevant to the patient's specific problems. This

possibility could be tested in both clinical and experimental studies.

As this discussion has shown, much of what we have demonstrated here is, in a sense, already familiar to us. The orientation pattern demonstrated for the majority of normal subjects is that of the first stories ever told: "Once upon a time, in a faraway kingdom, there lived a beautiful princess...". However, in spite of, or perhaps because of its very basic nature, the existence of a systematic cognitive structure underlying the orientation process has not previously been investigated. Our approach to orientation measurement has pointed to the significance of this sequential cognitive structure and its relationship to sensory and emotional expression, both in psychosis, and in normal mental functioning.

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Table 1

Latency of Orientation to Time, Place, and Person; Normal and Psychotic Subjects.

| Orientation Dimension | Normal Subjects (N=53) | | Psychotic Subjects (N=22) | | t value |
|---|---|---|---|---|---|
| | Mean | (S.D.) | Mean | (S.D.) | |
| | (prop. of narrative length) | | | | |
| Time | .05 | (.07) | .28 | (.34) | 4.77** |
| Place | .07 | (.10) | .26 | (.29) | 4.31** |
| Person | .33 | (.35) | .31 | (.31) | .17 |
| Overall (average) | .15 | (.13) | .28 | (.27) | 2.92* |

(* $p < .01$, ** $p < .001$)

Table 2

Pattern of Orientation to Time, Place, and Person; Normal and Psychotic Subjects

| Six Possible Permutations of Orientation Order: | Normal Subjects (N=53) | Psychotic Subjects (N=22) |
|---|---|---|
| | (Percent of Subjects) | |
| 1) Time, Place, Person | 56.6 | 27.3 |
| 2) Place, Time, Person | 24.5 | 22.7 |
| 3) Time, Person, Place | 15.1 | 4.5 |
| 4) Place, Person, Time | 1.9 | 0 |
| 5) Person, Time, Place | 0 | 22.7 |
| 6) Person, Place, Time | 1.9 | 18.3 |
| Unscoreable | 0 | 4.5 |

Table 3

Correlation of Orientation Latency with Referential Activity; Normal and Psychotic Subjects

| Orientation Latency | Normal Subjects (N=51) | Psychotic Subjects (N=22) |
|---|---|---|
| | (Correlation Coefficients) | |
| Time | .31* | .37* |
| Place | .32* | .32 |
| Person | .47** | .54** |
| Overall (average) | .54** | .48* |

(* $p < .05$; ** $p < .01$)

Table 4

Latency of Orientation to Time, Place, and Person; Full and Flat Affect Psychotic Subjects.

| Orientation Dimension | Full Affect Psychotic Subjects (N=10) Mean (S.D.) (prop. of narrative length) | | Flat Affect Psychotic Subjects (N=12) Mean (S.D.) (prop. of narrative length) | | t value |
|---|---|---|---|---|---|
| Time | .18 | (.25) | .37 | (.39) | 1.36 |
| Place | .11 | (.13) | .39 | (.33) | 2.55* |
| Person | .15 | (.13) | .45 | (.35) | 2.61* |
| Overall (average) | .14 | (.08) | .40 | (.31) | 2.55* |

(* $p < .05$)